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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,101	11/02/2000	V.M. Segal	30-5076(4015)	4990

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EXAMINER

WESSMAN, ANDREW E

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 03/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/705,101

Applicant(s)

SEGAL ET AL.

Examiner

Andrew E Wessman

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) 14-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 67-81 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-13, drawn to a physical vapor deposition target, classified in class 148, subclass 437.
 - II. Claims 14-66, drawn to a method for producing metallic material, classified in class 148, subclass 689.
2. The inventions are distinct, each from the other because:

Invention I is drawn to a product, and invention II is drawn to a process for making that product.
3. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process of invention II could be used to manufacture material for use in applications other than sputtering targets, such as structural metal parts.
4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Shannon Morris on February 13, 2001 a provisional election was made with traverse to prosecute the invention of I, claims 1-13.

Art Unit: 1742

Affirmation of this election must be made by applicant in replying to this Office action.

Claims 14-66 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 11, 12, and 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The open language of the claims renders the limitations of the claims indefinite, as the claims seem to suggest that nearly any material may be used, and therefore the scope of the claim is unclear. It is suggested that claims 11, 12, and 68 be written in proper Markush claim language. For example, claim 11 could be written, "The physical vapor deposition target of claim 1 consisting essentially of one or more materials selected from the group consisting of aluminum, copper, silver.....ytterbium, and thorium, and alloys thereof."

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1742

9. Claims 1-4, 7-13, 67-69, 71-74, and 77-81 are rejected under 35 U.S.C. 102(b) as being anticipated by Dunlop et al. (U.S. Patent No. 5,590,389).

Dunlop et al. anticipates the invention substantially as claimed. Dunlop et al. discloses (claim 1) sputtering targets made from aluminum, copper, and titanium. Dunlop discloses that the grain size should be less than 20 microns for an aluminum workpiece, and less than 30 microns for a copper workpiece. Dunlop et al. also discloses (see claim 13) a sputtering target with predominantly <220> crystallographic texture.

In regards to the features of claims 2, 7, 8, 72, 77, and 78, Dunlop et al. discloses (see claim 7) a sputtering target where all grains are smaller than 2 microns. The claimed sputtering target with an average grain size or substantially all grain sizes of less than 1 micron would be considered within the scope of this disclosure.

In regards to the features of claims 3 and 73, Dunlop et al. discloses (col. 3, lines 4-5) that porosity in the sputtering targets is completely undesirable.

In regards to the features of claims 4, 9, 10, 74, 79, and 80, Dunlop et al. discloses (col. 8, lines 55-65) that strong <220> textures are useful for providing good sputtered film uniformity. Dunlop et al. discloses that this is true for both planar <220> textures and axial <220> textures, which are also known as <200> textures.

In regards to the features of claims 11, 12, 67, 68, 69, and 71, Dunlop et al. discloses (claim 1) that the sputtering targets may be made of materials selected from a group including aluminum, copper and gold, among other metals.

In regards to the features of claims 13 and 81, Dunlop et al. discloses (claim 12) that precipitates in the sputtering target should be less than 1 micron in size, the scope of which includes precipitates of less than 0.5 microns in size.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5, 6, 75, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al.

The teachings of Dunlop et al. are discussed in above paragraph 9.

Dunlop et al. does not teach the ratios of the <220> crystallographic orientations relative to those of other orientations. However, Dunlop et al. does teach that strong <220> crystallographic textures are associated with high quality conical aluminum sputtering targets (col. 8, lines 63-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a sputtering target with the highest ratio of <220> crystallographic texture possible in order that the sputtering target provide the best sputtered film uniformity possible, as taught by Dunlop et al. (col. 8 lines 64-65).

12. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Segal (U.S. Patent No. 6,238,494).

The teachings of Dunlop et al. are discussed in above paragraph 9.

Art Unit: 1742

Dunlop et al. does not teach the use of silver for creating a sputtering target.

Segal teaches (claim 14) that sputtering targets may be made of silver.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further incorporate silver into Dunlop et al.'s sputtering target as disclosed by Segal (col. 1, lines 64-66), because one of ordinary skill in the art would expect to create a target capable of sputtering a thin film containing silver as taught by Segal (col. 1, lines 64-66) with the desirable film uniformity as taught by Dunlop et al. (col. 8, lines 64-65).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pavate et al. (U.S. Patent No. 6,139,701) teaches copper sputtering targets with fine grain size in order to enhance target hardness and reduce in-film defects.

Abhuri et al. (U.S. Patent No. 6,086,725) teaches sputtering targets with dominant <220> crystallographic texture.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew E Wessman whose telephone number is (703)305-3163. The examiner can normally be reached on Monday through Friday, 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703)308-1146. The fax phone numbers for

Art Unit: 1742

the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

AEW
March 18, 2002


ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700